



Faculty of Applied and Creative Arts

GARBAGE TRUCK DESIGN FOR BEACH AREA

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Bachelor of Applied Arts with Honours

(Design Technology)

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GARBAGE TRUCK DESIGN FOR BEACH AREA

LEE JAN BO

This project is submitted in partial fulfillment of
The requirements for the degree of Bachelor of Applied Arts with Honours
(Design Technology)

Faculty of Applied and Creative Arts
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UNIVERSITI MALAYSIA SARAWAK

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Final Year Project Report

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Abstract

The industry of tourism is rising in recent years as the flight fare is getting cheaper and trends among the youngsters. Beautiful beaches in Malaysia have become the attraction point of the tourists and it is bringing a lot of income to the tourism industry. Nevertheless, the tourists create a lot of rubbish while they are enjoying their time at the beach. The rubbish that is left on the beach pollutes the sea and destroys the balance of the ecosystem and environment of the beach. Although beach managing resorts and non-profit organizations are doing the duty to clean the rubbish at the beach, but the method is not efficient and tiring. Thus, the purpose of this research is to design a beach garbage truck that can assist the garbage cleaning and collecting process at the beach. This research has involved the process of identifying the existing beach vehicle and garbage truck and analysing their design. Also, qualitative method is used in this research to collect the data for analysis. The result has come out with a design of beach garbage truck named Scavenger which is a vehicle that can be driven by the garbage cleaner at the beach in their process of cleaning and collecting rubbish.

Abstrak

Industri pelancongan semakin meningkat dalam beberapa tahun ini. Peningkatan ini disebabkan oleh harga kapal terbang menjadi lebih mudah dan juga trend melancong dalam kalangan pemuda. Pantai Malaysia yang cantik telah menjadi penarikan pelancong dan membawa banyak pendapatan kepada industri pelancongan. Walau bagaimanapun, penlancong meninggalkan banyak sampah di kawasan pantai semasa mereka menikmati di kawasan pantai. Sampah yang ditinggalkan ni pantai menyebabkan pencemaran di laut dan memusnahkan keseimbangan ekosistem serta persekitaran pantai. Walaupun resort yang menguruskan pantai dan *non-profit organization* telah membersihkan pantai tetapi kaedah yang diguna oleh mereka tidak cekap dan sangat meletihkan. Oleh itu, penyelidikan ini bertujuan untuk mereka satu trak sampah pantai yang boleh membantu proses membersih dan mengumpul sampah di kawasan pantai. Penyelidikan ini telah melibatkan proses seperti mengenal pasti trak sampah dan kenderaan pantai yang telah wujud dan menganalisis reka bentuk mereka. Selain itu, kaedah kualitatif telah juga digunakan dalam penyelidikan ini untuk mengumpul data. Hasil penyelidikan ini adalah satu reka bentuk trak sampah pantai yang bernama Scavenger. Ia boleh dipandu oleh perkerja di pantai semasa menjalankan kerja pembersihan dan pengumpulan sampah.

Chapter 1

Introduction

1.0 Introduction

“Every year, government of Malaysia put massive amount of effort on promoting Malaysia’s tourism in hope of bringing more profit to the economy of our country through tourism industry. Their effort certainly did not go to waste as we have the result showing tourism ranked third in foreign income earning of our country which is 7% in the total foreign income earning of Malaysia” (Misachi, 2017). While not only the effort of the government, the reason Malaysia become such a world class famous tourists’ destination is due to its tropical rainforests, foods, multiracial cultures, and beautiful beaches.

Malaysia has many beautiful beaches and island all over the country that attract a lot of local and foreign tourists. According to Cable News Network (CNN) in 2013, 3 beaches from Malaysia are part of the World’s 100 best beaches (StudyMalaysia.com, 2015). The 3 chosen beaches are shown as below:



Figure 1.1. Pulau Perhentian Kecil. Reprinted from *Bubu Long Beach Resort*, Retrieved from <https://www.airasiago.com.my/Terengganu-Hotels-BuBu-Long-Beach-Resort.h8156783.Hotel-Information>.

Figure 1.1 shows the scenery of Pulau Perhentian Kecil in Terengganu. Pulau Perhentian kecil is a smaller island located beside the bigger Pulau Perhentian Besar.



Figure 1.2. Juara Beach, Pulau Tioman. Reprinted from *Juara Mutiara Resort*, Retrieved from <http://pakejpulau.com/pakej-pulau-tioman/juara-mutiara-resort>

Figure 1.2 shows the scenery at Jurau Beach of Tioman Island, Pahang.



**Figure 1.3. Tanjung Rhu, Langkawi. Reprinted from
Tanjung Rhu Resort Langkawi *****,
Retrieved from
<http://magchild.com/2015/hotels/tanjung-rhu-resort-langkawi>.**

Figure 1.3 shows Tanjung Rhu of Langkawi, Kedah. Tanjung Rhu is one of the many beaches on Langkawi Island.

Thus, we can see that not only these beautiful natural beaches are the precious gift of mother nature, they are also important and reliable source of economy to our country. From the chart below, we can see there is a massive number of foreign tourists came to our country in last year.

FACTS & FIGURES OVERVIEW



Figure 1.4 Total tourists' arrivals and receipts to Malaysia recorded by Ministry of Tourism of Malaysia. Reprinted from Malaysia Tourism Statistics in Brief.

Retrieved from <http://www.tourism.gov.my/statistics>

As observed from the chart above. There are 26.8 million foreign tourists visited Malaysia in 2016. Although it is not mentioned, but a lot of them could have visited one of many beaches in our country. From here, it is clear that tourism is a vital element in making profit for Malaysia and beautiful beaches that act as one of the tourist attraction must be very well taken care of.

But, in the opposite, as the beach tourism industry rise higher and the more foreign visitors come into our country, more garbage are also produced by the tourists and left in the beaches after they had their fun at the beaches. According to Wastedbeaches (2010), not only foreign tourists are leaving their garbage at the beaches, but sadly even local people are leaving their garbage behind at the beaches.



**Figure 1.5 Garbage pile on Pulau Perhentian. Reprinted from
*Waste Management in Malaysia: In the Dumps***

Retrieved from

<http://cleanmalaysia.com/2015/09/04/waste-management-in-malaysia-in-the-dumps/>

Figure 1.5 shows the accumulated garbage on Pulau Perhentian. The plastic dumped by the tourists spoil the environment at the beach.



Figure 1.6 Plastic garbage on the beach of Pulau Kapas. Reprinted from *These Photos of Pulau Kapas Covered in Rubbish Will Break Your Heart*

Retrieved from

<http://says.com/my/lifestyle/this-girl-s-photos-of-garbage-at-the-beach-is-why-we-need-to-reduce-the-usage-of-plastic>

Figure 1.6 shows the scattered rubbish on Pulau Kapas. The rubbish is left unclean on the beach.



Figure 1.7 Garbage on one of the beach in Malaysia. Reprinted from *Garbage on the Beach Is Bad for Your Mental Health*
Retrieved from <https://www.hakaimagazine.com/news/garbage-beach-bad-your-mental-health/>

Figure 1.7 shows a scenery in one of the beach in Malaysia taken by a foreign journalist. The article argue that a dirty beach can be bad for the mental health of tourists.

Some garbage found at the beach are not left or littered at the beach. They were left at other shore and float a long way to reach where they are found. But the garbage must be cleaned whenever they are found as there is no need for the garbage to once again return into the sea and continue their voyage onto another shore.

Method used currently

There are According to researcher's finding, there is no solid, efficiency and reliable system of garbage management for beach area. For now, there is only 2 known method of cleaning garbage at the beaches.

1.) Volunteer by civilian. Which usually happened as an event and held by such organization such as WWF or by concerned civilian. But this method is not reliable because it has no routine, and it is not consistent.

2.) Resort management. In this method, garbage scattered along the beach will be picked up by the cleaning staff of the resort that in charge of the beach. The staffs will walk along the beach to pick up the rubbish and deliver the garbage to a centre bin for collection. This method is rather consistent, but it is time consuming and not efficiency.

1.1 Statement of Problem

Garbage on the beach is no longer a fresh topic on the table. We can always find a piece of news on the newspaper talking about the problem caused by the garbage on the beach.

Basically, garbage on the beach can be categorised into 4 groups (Lim,2015).

- a. Tourists littering at the beach.
- b. Urban garbage wash down to beach by storm.
- c. Rubbish from fishing activities. Such as fishing lines and nets.
- d. Garbage thrown overboard from boats and ships.

One of the explanation for the abundance of garbage on the beach is due to poor or ineffective waste management (Lim, 2015, Datuk Lim Kok Boon is the president of Malaysia Plastics Manufacturers Association). Also, according to researcher's findings, the waste management methods used currently for beach area are not solid and non-reliable.

The first method is used by beach resort to clean the beach under their management. The method required the workers to walk along the beach and pick up the rubbish while carrying the garbage bag with their hand. This method is not only tiring but also time consuming and not efficient. While another method is volunteer by concerned civilian. The process is quite like how the resort workers clean the beach except this is organized by non-profit organization. In another word, there won't be a consistent shift and numbers of people attend to clean the beach. Therefore, making this method is not reliable either.

Thus, the researcher conducts the study to solve the problem by designing a beach garbage truck to assist the workers on their duty.

1.2 Objectives of study

The objectives of carry out the study are:

- i. To identify the important of beach garbage truck.
- ii. To analyse the existing garbage truck design.
- iii. To propose a new design for beach garbage truck.

1.3 Research Question

- i. What are the consequences caused by leaving garbage on the beach?
- ii. What are the current beach cleaning methods?
- iii. What are the strengths and weakness of existing garbage truck design?

1.4 Scope of study

There are many beaches in the whole Malaysia and the problem of garbage in the beach is not the problem of one or two of the beaches but many of them. Thus, the researcher decides to set the scope of the study to all the beaches in Malaysia so that the problem of garbage scattered on the beach can be solved.

1.5 Significance of study

This research is study on the lack of garbage collection vehicle on the beach. Hence, garbage left by the tourists on the beach will scattered around the beach. Garbage left on the beach can cause problem to ecosystem, pollution, and tourists will stop coming to the beach.

Thus, the significances of this research are:

- 1) Assist the beach cleaning process.
 - The cleaning method using currently is to have to cleaning workers walk along the beach and carrying a bag of garbage. A beach garbage truck can assist them in traveling instead of walking and without having to carry the garbage bag by hand.
- 2) Save the time of cleaning process.
 - The cleaning workers now have to walk along the beach to collect the garbage, but walking can be time consuming and tiring. In this case, a garbage truck will save their time.
- 3) Increase efficiency of work.
 - With the beach garbage truck, the workers can travel longer distance and clean the beach in shorter time which means higher productivity. Not only that, they can also carry tools in the truck that they need in the cleaning process.
- 4) New option of entertainment for tourists
 - Although there is already existing entertainment beach vehicle for tourists. With simple modification, the new beach truck can also be functioned as an entertainment trucks for the tourists which provide more fun for them.

1.6 Limitation

The limitation in the research is that the researcher is unable to travel to most of the beaches in Malaysia.

1.7 Summary

In conclusion, the research is intended to acquire data regarding the existed beach vehicle, existed garbage truck, the method of garbage collection at the beach, and the function that can be performed by the beach garbage truck. The data is important to ensure the functionality and practicality of the design.

Chapter 2

Literature Review

2.0 Introduction



Figure 2.1 First generation garbage truck. Reprinted from *The Fascinating History Of The Garbage Truck And The Knoxville Mayor Behind It*.

Retrieved from <https://jalopnik.com/5955401/the-fascinating-history-of-the-garbage-truck-and-the-knoxville-mayor-behind-it>

Garbage truck is “a large vehicle that is driven from one house to another to collect rubbish from the bins outside” as define by Cambridge Dictionary (n.d.). The history of garbage trucks date back to 1800s. As shown in figure 2.1, the first generation of garbage truck are cars pulled by horses and only until early of 1900s that the horse-pull-cars been replaced by engine garbage truck (Estrada, 2012). Garbage collected from the will be separated into recyclable and non-recyclable. Recyclable garbage will be sent to recycle while non-recyclable garbage will be sent to landfills.

On the other hand, beach vehicles are the vehicles that specialized to run on the beach. In this study, the researcher will look into some of this type of vehicle as the beach garbage truck will also function as beach vehicle.